GEOGRAPHIC SCHOOL BULLETINS

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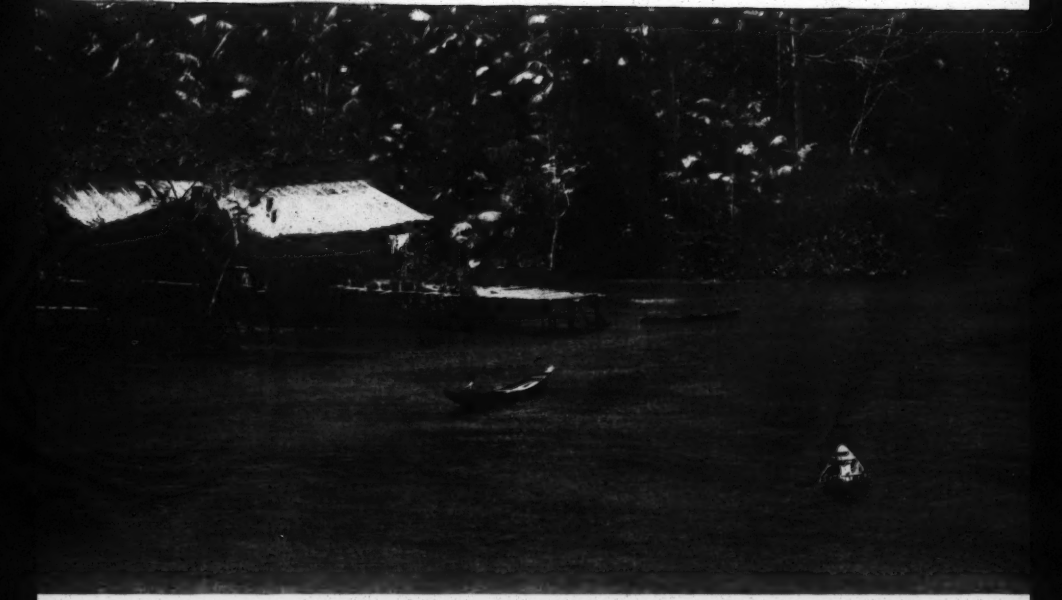
VOLUME 37, NUMBER 22, MARCH 16, 1959 . . . *To Know This World, Its Life*

- Progress Overtakes the Amazon
- Everyday Wonder of Wood
- Hungry Termite, Janitor of the Forest
- Andrew Jackson, Frontier President

RUBBER PROFITS half a century ago built the world's most expensive opera house in Manaus, jungle city a thousand miles up the Amazon River.

PAN AMERICAN UNION



LT. COL. ALBERT W. STEVENS

flows 3,900 miles east through Peru and Brazil to the Atlantic Ocean. Francisco de Orellano, the Spaniard who first descended the Amazon from the Andes, was attacked by a band of women warriors on his trip in 1541. He named the river for the Amazons, women warriors of Greek mythology.

Second only to the Nile in length, the Amazon is second to none in water volume. At its mouth the collected waters of hundreds of rivers pour into the Atlantic at an average rate of 150 billion gallons an hour. The muddy current can be seen 200 miles at sea. In flood, the river creates backwaters the size of Lake Erie. Natives build their huts on stilts to keep the floods from their door (above). It is common to see a man paddle his canoe straight into the house at floodtime. Others live on houseboats.

BLACK STAR

ANIMALS GROW BIG in the Amazon jungle. The giant armadillo (above) may attain a length of three feet, not counting the tail, and a weight of 100 pounds. The otter, usually three feet long, may grow here to 10.

The Amazon's mouth is 200 miles across. Ilha do Marajó, an island in the mouth, is larger than Denmark.

Steaming up the green flood, ocean-going ships can reach Iquitos, chief city and trade center of easternmost Peru, 2,300 miles from the Amazon's mouth. Thick jungle punctuated by villages surrounds the city. Barefoot Indians bring in rubber, hides, tagua nuts, cotton, and timber to be loaded on steamers bound for the United States and Europe. An oil refinery is a sign of the new times.

In Manaus, 1,250 miles downstream, progress is not new, only dormant. Although no concrete roads yet lead to the city, the automobile made it a boom town in the early part of the century.

The cry around the world for rubber tires echoed in the forests near Manaus where rubber trees grow wild. Great for-

20th Century Steams Up the Amazon

A NEW CURRENT overflows the banks of the greenish Amazon: progress. It does not gush. Rather, it inches along the banks. The Indian fisherman lives in a one-room thatched house with crushed bamboo floors. He stalks his prey as his ancestors did centuries ago, with the bow and arrow or spear.

But there is a significant difference. He fits his dugout with an outboard motor (left) which he buys with alligator skins and pirarucu, one of the largest fresh-water fish.

PAN AMERICAN UNION

He hunts with a seven-foot bow or a twelve-foot blowpipe and poisoned darts. His targets are food for the family: monkey, boa constrictor, tapir, anteater, deer, jaguar, iguana, and parrot.

While he hunts and fishes, his wife tends the crops—manioc, Indian corn, yams, sweet potatoes, peanuts, and tobacco. Farming is unrewarding, and only the barest essentials are grown. The soil is poor underneath the jungle trees. Once cleared and exposed to the sun and heavy rains, the land loses its fertility in a few years.

About 250 known Indian tribes speaking 37 different languages people the rain forest of the Amazon region. Some are less advanced than Stone Age man. Some are known to scientists. Others remain shrouded in the mystery of the jungle. Some attack the white man on sight with palm lances. Only slowly can the white man make friends with them.

But geologists are taking inventory of the Amazon region's resources. Oil has been discovered. The insistent clang of derricks ramming down well pipe rings over the chattering of jungle monkeys. Mines are being dug. Timber experts are taking stock of the giant jungle trees and finding new uses for them. Sawmills increase. Sanitation wipes out malaria, scourge of the jungle dweller. Air routes substitute for train tracks and roads that can be built only with great difficulty.

Progress comes late to a region as thick with jungle and as sparsely populated as the Amazon. Although the basin—covering 2,053,000 square miles—is two-thirds as large as continental United States (without Alaska), it supports only 3,000,000 people compared with 175,000,000 in the United States.

Draining parts of six countries—Bolivia, Peru, Ecuador, Colombia, Venezuela, and Brazil—the river rises high in the Peruvian Andes, almost on the Pacific coast. It

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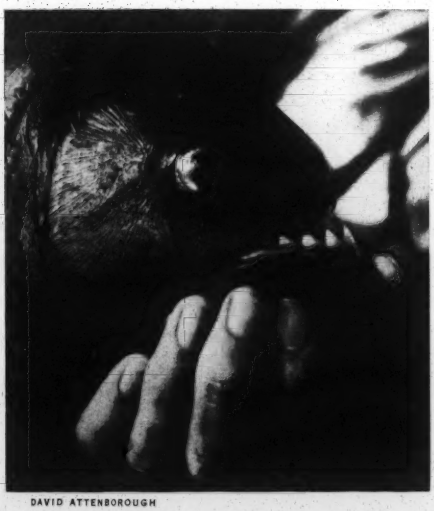


DAVID ATTENBOROUGH

BLOOD-THIRSTY piranhas, built like bass or sunfish and not more than a foot long, dine on flesh in the river. With one lunge, the fish's fearsome teeth can chew off a piece of flesh the size of a silver dollar and half an inch thick. A school can strip the flesh from a sheep in two-and-one-half minutes. Many an Indian has lost a finger when he dipped his canoe paddle too far into the water. Piranhas will attack and destroy animals many times their size.

Airfields gashed out of the forest permit commercial airlines to take the direct route from Miami to Rio de Janeiro, shortening by 1,500 miles the trip—which formerly took them around the bulge of South America.

Belém, near the Amazon's mouth, feels the push of upstream progress. Through this port pours much of the produce of the Amazon Valley. Tons of oilfield supplies and drilling equipment are shipped upstream from Belém docks. Although founded in 1616, Belém is a modern city, typically Latin American, with iron-grilled windows and overhanging balconies dominating building façades (below). It has a modern airport, more than a mile of docks, a new electric power plant, and a research center devoted to the study of tropical agriculture.

The present boom marks the third time man has tried to tame the Amazon region. The 16th century Spanish conquistadors tried it in their research for the golden El Dorado. Rubber traders tried it in the early part of this century.

Neither attempt succeeded. In both, the aim was exploiting the area for all it was worth. Today's goal is to develop the basin for millions of people. Perhaps it will find more success. L. B.

INTERCONTINENTAL HOTELS

tunes were built. Mansions of imported Carrara marble rose. The world's most expensive opera house (see cover) grew in the city although a mile from the end of the car line one could hunt boa constrictors and jaguars.

But prosperity did not last. An Englishman smuggled rubber tree seeds out of Brazil and started plantations in Malaya. The trees thrived under cultivation and Asia undersold the wild Amazonian rubber. Shutters closed on the Manaus mansions. Grass grew in the streetcar tracks.

Today the ghost town awakes to take its old place as an important Amazon city. A new 5,000-barrel-a-day oil refinery supplies fuel to river boats. Light industry increases. One factory turns out sheet rubber. Others process Brazil nuts, hides and skins, rosewood oil, gums, jute, and dried fish. Freighters bound for New York, New Orleans, or Europe load at docks built during the rubber boom. A modern $2,000,000 hotel opened in 1951. A large new airport provides easy access to the city.

BETHLEHEM STEEL COMPANY

Downriver from Manaus, 125 miles from the Amazon's mouth, stands Macapá, a symbol of Brazil's potential. The discovery of rich manganese deposits accomplished a miracle of modern industrialization. A whole mountain of it lies in the Serra do Navio district northwest of Macapá. A Brazilian-United States company has dug a mine to yield 600,000 tons of manganese annually.

A new railroad hauls the ore 122 miles to Porto Macapá near the city of Macapá, where the mining company maintains a railroad depot, docks, and related facilities (above) for loading the ore in ocean-going ships. New navigation aids allow the ships to take the short route through the north channel of the river instead of going around the south past Belém as they had to at one time.

Industrialization has changed the face of Amapá, the territory where the ore deposits lie. Where it once cost five cruzeiros to buy a bath, water now flows from spigots. Macapá had no electricity 15 years ago. Today a diesel-powered lighting system provides it. Schools dot the area.

In the savanna and jungle north of Amapá, 25,000 peasants once eked out a meager living from nut and rubber gathering, raising beans and manioc, lumbering, and some gold panning. The population has now doubled. An experimental farm works with an eye to increasing the food supply for the booming population.

Health standards rise. Hospitals and public health clinics multiply. Government aid stimulates the growth of fisheries.

Not all of the population expansion takes place in Amapá. Pioneers march west to settle on the Tocantins, Araguaia, and Xingu Rivers, tributaries of the Amazon. Farms, ranches, mines, and factories sprout out of wilderness.

las fir, ponderosa pine, redwood, western hemlock, white fir, sugar pine, and western red cedar—together with southern yellow pine, provides construction lumber.

The ringing cry of "timm-berr" heralds the beginning of the dramatic journey from forest to sawmill. Logs are snaked by tractor or shot down flumes into rivers. In the spring log drive, they float downstream, often getting into jams. Then lumberjacks (above), leaping from log to log with peaveys, find the timber that must be moved before the jam can be broken. Logs flow on to the sawmill where nature's biggest living things await transformation into more than 5,000 products like the ones on these pages.

AMERICAN FOREST PRODUCTS INDUSTRIES

E. I. DU PONT DE NEMOURS & COMPANY

Roaring sawmills sort, wash, peel, and cut the logs. Steel teeth chew off slabs, then slice them into boards and beams at the rate of 36,000 millions of board feet annually.

Wood from an average Douglas fir will build two typical American homes. Eight out of every ten Americans live in houses of wood.

Wood, too, supplies a large part of the furniture for these homes. The furniture and fixture industries account for almost half of the lumber used in manufactured products.

But more and more in construction —residential and commercial—building materials made *from* wood as well as *of* wood are being used.

Such products as plywood and laminated wood open new vistas. From waste piles, manufacturers conjure up "synthetic woods." Mixing shavings or chips with a binder, then applying pressure, they can turn out a "hardboard" or a "particle board." Such substitutes may be tougher than a real plank. Sawdust, long a useless byproduct, has won a role in fertilizer.

Throughout history man has depended on wood—but the ways in which he could use it were limited. He could cut it, carve it, sometimes bend it. He could smooth it or paint it. But it was always wood.

Science has now discovered that

ROSS HALL

WOOD ◆ ◆ ◆ Another Everyday Wonder

FROM SCRUB PINE to towering sequoia—from toothpick to telephone pole—the tree and its wood are true everyday wonders. And wood chemistry brews even more marvels.

Caveman clubbed beasts for food, roasted them in bonfires, and devoured them while sitting on a stump. He took his first ride on a floating log.

In the morning, we throw back our covers—perhaps of wood cellulose fibers—and put our feet on wooden floors. We comb our hair and brush our teeth with wood derivatives. At school, we sit at wooden desks, read from books—and the Geographic School Bulletins—printed on wood-pulp paper, write with wooden "lead" pencils.

After school we knock out a few flies with a hickory bat, and before turning in we watch a TV movie, filmed on celluloid. Our TV cabinet is probably wood veneer. Finally, we set our cellulose plastic-cased alarm clock to wake us up tomorrow to begin another day surrounded by wood.

Forests provide the world's most widely used raw material. Unlike other important natural resources (except water power), wood is replenishable. With care, forests need never be used up. But that care hasn't always been taken.

The early colonists sailed to America on stout-timbered ships and erected wood stockades for refuge. The first cargo Virginians sent back to England was cedar logs. Pine was a principal export of New England colonies.

As the new country grew, pioneers rolled westward on wooden wagon wheels, clearing land, putting up log cabins.

Lumberjacks accompanied trapper and settler. As readily available land and timber were taken, they pushed on. The fabled Paul Bunyan migrated from the logged-over forests of first Maine, then Michigan and Minnesota, to the tall timber of the Pacific Northwest.

Today, softwood from the West—Doug-

TERMITES

Ravage Buildings; Aid Forest Growth

ABOUT THIS TIME OF YEAR the sleeping uglies—princes and princesses all—awake.

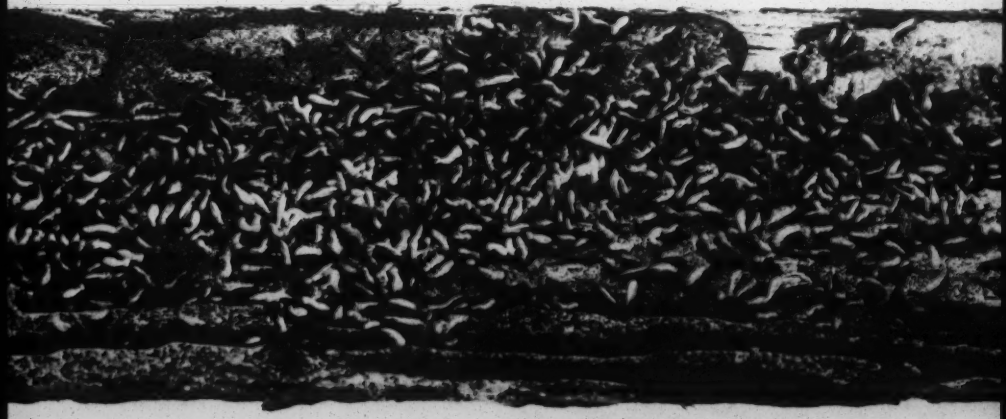
The kiss of warmth and age-old instinct call them from dank wooden palaces for a short spree in the air. Soon they will settle in dark dungeons, prisoners again for the rest of their lives.

Such is the curious royalty of the termites—extremely useful insects, but miserable house guests.

Around the world the termites gnaw, keeping within the life cycle the elements locked in dead wood. This is their function in nature—to break down the strong fibers so that carbon, hydrogen, and oxygen can be used by other plants. Without their janitor work in the woods, it is possible that so much vital material would be locked forever in dead trees that earth would be uninhabitable.

But when they turn their appetite for cellulose toward the works of man, termites become "Public Enemy No. 1" of the insect world. Each day they do $250,000 damage in the United States alone.

U. S. DEPARTMENT OF AGRICULTURE



Only the royalty wear wings. When they fly, they seek a supply of wood and moisture to found a new colony.

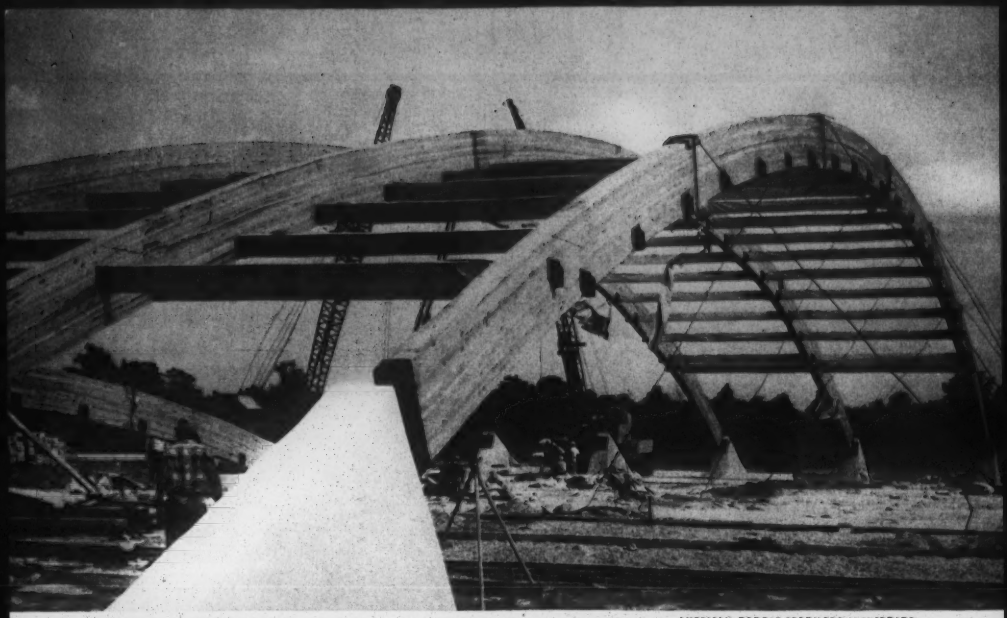
The queen becomes a highly-efficient egg-laying machine, capable of depositing 30,000 in a single day. She swells up so much she cannot feed herself or move about. Her offspring take care of her.

Most of these become workers. Their life has no room for fun or rest. They never sleep; never loaf. Ceaselessly, they labor for the community, collecting food, building burrows, raising the young.

They will probably never taste the open air. Their tunnels and galleries inside logs and lumber often approach the surface, but never break through except in swarming time. When a termite-infested log is split, as in this photograph, the insects tumble over each other in their haste to get out of the light—scurrying so fast they blur on the photographer's film.

F. S.

UMI



AMERICAN FOREST PRODUCTS INDUSTRIES

basically wood is the same as corn, cotton, even coal and petroleum. All plants contain just about the same substances.

A tree, like every living thing, is built of cells. These cells, in the form of tubes, are made of cellulose. About two-thirds of wood is cellulose; one-third, lignin. Lignin binds the cellulose cells together.

In the laboratory, wood cellulose, when treated with different chemicals, is changed into many products—gun-powder, film, alcohol, rayon, cellophane, imitation leather, lacquers, cellulose sponges like those on page 259, felt, sugar, molasses, yeast, and paper.

Papermaking is one of the biggest forest industries. From fancy Christmas wrappings to the lowly brown shopping bag, it is an everyday wonder in itself.

Hundreds of everyday necessities—such as the telephone which is half wood—are produced from various types of plastics compounded from trees. About 70 per cent have a cellulose base; others are from wood flour and lignin. Even by-products from the manufacture of one plastic can often be used in another.

With more and more uses being found for wood, won't the supply run out?

The answer is, "No, if . . ." If there is reduction and prevention of waste; if good forest management is practiced; and if unexploited regions are opened up.

In the United States, one-third of the land area is still forest—more land for growing trees than for crops and pastures. The more than 100 species of trees in commercial use come from land cut off one or more times in the past 300 years.

Forests, like other crops, are now planted, tended, and harvested according to systems of cutting planned to assure a continuous supply of timber.

Unlike the ordinary farmer, the tree farmer doesn't harvest all he grows each year. By cutting only a portion of his trees, he can "farm" his crop all his life. His children can do the same.

Studies have shown that the quantity of wood used in industry and for wood products is one of the major indexes of economic development. Half of Asia's meager wood supply is burned as fuel; in North America, three-quarters of it is processed by industry.

Western Europe is now the greatest single timber-importing area. North America currently has a net export surplus. Forests of South America, Southeast Asia, and Africa lie scarcely touched.

If mineral supplies fade, wood may gain even more uses. Laminated wood arches (above) do a job steel once had to do. Wood, which served caveman and colonist, remains a mainstay—but in many exciting, new forms.

F. W. R.

Admitted to the union in 1796, Tennessee sent Jackson to Washington as its first Representative in Congress. In 1797, the state legislature elected him to the Senate. The young lawmaker soon became impatient with the smooth Virginia and New England aristocrats who dominated the government. He resigned his Senate seat in 1798 and retired—he thought for good—to private life.

But he plunged into Tennessee politics and resumed his land speculations. More than once, he teetered on the edge of bankruptcy.

Events soon catapulted him back into the national limelight. One rainy night in February, 1812, young Thomas Hart Benton, who later became famous as a U. S. Senator, banged on the door of The Hermitage, shouting that a war with Britain had been declared. Given command of a militia force, Jackson struck south against the Creeks, Indians who had suddenly rebelled. This savage, no-quarter campaign ended in American victory, with much of the credit going to Jackson. His dogged determination drove wavering volunteers into battle, and he attracted the attention of officials in faraway Washington. When the British later threatened New Orleans, he rallied American forces and smashed the invasion (next page).

Soon, people began calling Jackson "Old Hickory" and his reputation as a man of courage and determination spread across the country.

In 1818, Indians along the Georgia-Alabama border went on the warpath. Jackson, sent with a force to restore peace, marched into Spanish Florida and captured Pensacola. Both Spain and Great Britain protested. Threatened with war, the United States carefully negotiated a settlement. Later, when we purchased Florida, Jackson sat as first Governor of the new territory.

Friends urged him to run for President, and in 1824 he consented. In those days each party's caucus—a name given to the party's representatives in Congress—met to nominate the party's Presidential candidate. But Andy Jackson scorned the endorsement of any caucus. His nomination came from the people.

No candidate received a majority of the electoral vote in 1824. Thus the election was thrown into the House of Representatives—the only time this has happened. Outmaneuvered there, Jackson lost.

He bided his time. Four years later he swept the country so completely that the politicians never forgot the lesson. From Jackson's success came the political party as we know it, seeking votes with an appealing platform.

What kind of a President was Andrew Jackson? Loyal to his friends, he saw that they got government posts. Jackson believed "to the victors belong the spoils"—spoils in this case being jobs. When there were no more vacancies, Jackson made room for his friends by firing old employees. (Today, government workers are protected from "the spoils system" by Federal law.)

Although the Civil War came 30 years later, Americans during Jackson's administration already debated whether national or state government should be supreme. At first, no one knew which side Jackson, until then silent, would take. He set doubters straight and disheartened nullifiers with a ringing declaration: "Our Union, it must be preserved."

Because he was a strong-willed man, who impatiently pushed opposition aside, Jackson accustomed people to a President who said what he thought and got things done. Retiring after his second term in 1837, he left the Presidency a stronger, more respected office than it had been when he took it.

Eight years later, Jackson died at his beloved Hermitage. Field hands chanting mournfully outside his quiet bedroom echoed a nation's sorrow. R. T. C.

UMI

"I COULD THROW HIM three times out of four," said a schoolmate of Andrew Jackson, remembering youthful wrestling matches. "But he never would stay throwed. He was dead game and would never give up."

History might well repeat these words when it pronounces its verdict of the United States' seventh President, whose portrait in the uniform of major general was painted by Thomas Sully. Often "throwed"—by well-meaning friends, relentless enemies, ill-fortune, and the consequences of his own rash temper—Andrew Jackson was game. He never gave up.

LIBRARY OF CONGRESS

Rough-Hewn 'Old Hickory'

THIS WEEK, A GREEN, four-and-a-half-cent stamp goes on sale at a tiny post office near Nashville in central Tennessee. The new issue, below, pictures Andrew Jackson's pillared mansion, The Hermitage.

Young Andrew came to Tennessee from North Carolina in 1788. In 1795 he and his wife Rachel built the first Hermitage, a log house. A second house, built in 1818, later remodeled, burned in 1834. The present Hermitage was built in 1834-35.

Jackson was born in a remote settlement on the North Carolina-South Carolina border, in 1767. Orphaned in 1781, he always remembered his mother's last advice: "Andy, never tell a lie, nor take what is not your own, nor sue for slander. *Settle them cases yourself.*"

No frontier lad in those rough and tumble times could fail to understand this admonition: if someone questions your honor, challenge him to a duel and shoot him if you can. Long since outlawed, dueling was common on the frontier, where a man's survival often depended upon his skill with fists or gun. Jackson never hesitated to call his enemies to account.

When Andy arrived in Tennessee the young American republic had discovered its muscles and begun to flex them. New land, new settlers, and new towns pushed civilization ever westward. Fortunes could be made—and lost—overnight. Andy determined to make his. He became a farmer and speculator, buying and selling large tracts of land.

Battle of New Orleans Aims Jackson at Presidency

LIBRARY OF CONGRESS

THE WAR OF 1812 is filled with contradictions. Although Great Britain was the enemy, many Americans wanted to fight France, or not fight at all. A treaty signed in Europe in 1814 ended the war without settling the issues that caused it. America's most decisive victory—the Battle of New Orleans—came after the war ended but before slow sailing ships could bring news of the peace treaty across the Atlantic.

None of this confusion detracts from the glory of Andrew Jackson's victory at New Orleans on January 8, 1815. His tattered army of 5,500 turned back twice as many British, including seasoned veterans fresh from the war against Napoleon. Since peace had been signed, the victory did not save the country. But it saved something important—American self-respect. Jackson's army beat the best in the world, and restored the pride of a nation humiliated by a war that had brought a series of defeats.

The British struck shrewdly. A victory at New Orleans could have cut the United States in two. Jackson threw fortifications across the British route and waited. His forces included buckskin-clad frontier marksmen and fierce Creole pirates given amnesty so they could serve. When crack British regiments attacked, a withering fire tore holes in their ranks and they fell back in defeat. They lost 2,500 men in the heroic assault; the British commander, General Packenham, fell slain. American losses: seven killed, six wounded.